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(54) **Flexographic printing apparatus for application to offset printing units**

(57) The present invention relates to a flexographic printing apparatus for application to offset printing units, the main feature of which is that the apparatus compris-

es, at the printing plate bearing cylinder of an offset printing machine, a supporting unit for supporting a plurality of anilox cylinders, which can be selectively caused to contact the printing plate bearing cylinder.

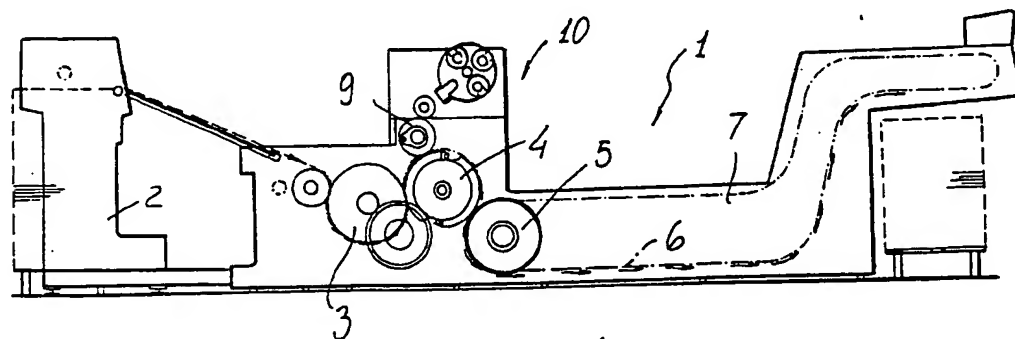


FIG. 1

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Description

The present invention relates to a flexographic printing apparatus for application to offset printing units.

As is known, offset printing units or assemblies carry out an indirect type of printing and they are not designed for easily carrying out other types of printing processes such as the flexographic printing, which is typically a direct type of printing.

This fact constitutes a great limitation for the operating flexibility of these printing machines and does not afford the possibility of using, upon simple modifications, the offset printing units or assemblies in order to provide flexographic prints, with the consequent possibility of changing the used ink type.

SUMMARY OF THE INVENTION

Accordingly, the aim of the present invention is to overcome the above mentioned drawbacks, by providing a flexographic printing apparatus designed for application to offset printing units, for quickly and simply transforming a conventional offset printing unit into a flexographic printing machine, with the possibility of easily selecting the type and amount of inks to be applied.

Within the scope of the above mentioned aim, a main object of the present invention is to provide such a flexographic printing apparatus allowing to automatically replace the anilox cylinders or rollers engaging with the printing plate, thereby providing a printing machine very flexible from the operating standpoint.

Another object of the present invention is to provide such a flexographic printing apparatus which, owing to its specifically designed construction, is very reliable and safe in operation.

Yet another object of the present invention is to provide such a flexographic printing apparatus, for application to offset printing units, which can be easily made starting from easily available elements and materials and which, moreover, is very competitive from a mere economic standpoint.

According to one aspect of the present invention, the above mentioned aim and objects, as well as yet other objects, which will become more apparent hereinafter, are achieved by a flexographic printing apparatus for application to offset printing units, characterized in that said apparatus comprises, at a printing plate bearing cylinder of an offset printing machine, a supporting unit for supporting a plurality of anilox cylinders, which can be caused to selectively contact said printing plate bearing cylinder.

BRIEF DESCRIPTION OF THE DRAWINGS

Further characteristics and advantages of the present invention will become more apparent hereinafter from the following disclosure of a preferred, though

not exclusive, embodiment, of a flexographic printing apparatus designed for application to offset printing units, being illustrated, by way of an indicative, but not limitative, example, in the accompanying drawings, where:

Figure 1 is a schematic view illustrating a offset printing unit to which the apparatus according to the invention has been applied;

Figure 2 is a further schematic view, on an enlarged scale, illustrating the detail of the flexographic apparatus;

Figure 3 is a perspective view of the flexographic printing apparatus;

and

Figure 4 is a front partially cross-sectioned view illustrating the subject flexographic printing apparatus.

DESCRIPTION OF THE PREFERRED EMBODIMENT

With reference to the number references of the above mentioned figures and, more specifically, to Figure 1, an offset printing unit generally indicated by the reference number 1 is herein illustrated; said offset printing unit comprises, in a per se known manner, a sheet feeding assembly 2, provided for conveying the sheet to be printed upon to a transfer roller 3, which is coupled to a printing cylinder 4, in turn operatively associated with an output sheet transfer cylinder 5; on this cylinder 5 a chain 6 is entrained, said chain including a plurality of grippers for conveying the sheet inside a drying assembly or unit, generally indicated by the reference number 7.

The main feature of the invention is that, at said printing plate bearing cylinder 9 of the offset printing unit, a flexographic printing apparatus generally indicated by the reference number 10 is provided.

Said apparatus 10 comprises, substantially, a carousel element 11, including two end flanges 12, which peripherally support the end portions of a plurality of anilox cylinders 13 which, in the embodiment being disclosed are four, but which could be obviously provided in any desired number.

The anilox cylinders have a cylinder surface which has been preliminarily subjected to any desired surface treatments, to provide therein small cells or hollows, in which the printing ink will deposit.

The anilox cylinders 13 are engaged, at their end portions, by a slide 20 designed for bringing each individual anilox cylinder 13 to the printing plate bearing cylinder 9.

The anilox cylinder 13 contacting said printing plate bearing cylinder 9 is supported, at the end portions thereof, by truncated cone-shaped plug-in elements 21, clearly shown in Figure 4, which can be so driven as to engage with and disengage from a respective anilox cylinder, while providing a perfect centering and locating of

said cylinder.

On the cylinder 13 contacting the printing plate bearing cylinder 9, an ink application unit 30 operates, said ink application unit being provided, at its contact end portions, with doctor blades for properly spreading the desired inks on the anilox cylinder, which inks could be water-based inks, U.V. based inks, as well as "flexo-inks" such as of a gold type.

Typically, said inks will have a comparatively high fluidity, and will include therein very volatile solvents so as to facilitate the drying of said inks.

In operation, the anilox cylinder will be rotatively driven by a driving geared unit 35, thereby spreading the ink over the printing plate to directly print the sheet.

At the head portions of the carousel supporting the anilox cylinder or roller magazine, are moreover provided holding arms, indicated by the reference number 40, provided for engaging the end portions of the anilox cylinders or rollers in order to properly hold said cylinders on their supports, while allowing said cylinders to be easily brought to their operating positions.

In operation, by properly changing the anilox cylinders or rollers brought in contact with the printing plate bearing cylinder, it will be possible to carry out several types of flexographic printing operations, together with the possibility of providing a multiple colors printing, by supplying in succession a plurality of like assemblies.

Moreover other operating units can also be mounted on the disclosed flexographic apparatus, such as embossing units, recording-embossing units as well as numbering, punching units and so on.

In this connection it should be also apparent that scrapable inks could be also used, on paper sheets having a basic weight from 60 to 80 grams and with a maximum thickness of 12/10 mm.

From the above disclosure it should be apparent that the invention fully achieves the intended objects.

In particular, the fact is to be pointed out that a very practical and flexible printing apparatus has been provided, which can be easily applied to a conventional offset printing unit, thereby improving the operation of the latter.

The invention, as disclosed, is susceptible to several modifications and variations, all of which will come within the scope of the invention.

Moreover, all of the details can be replaced by other technically equivalent elements.

In practicing the invention, the used materials, provided that they are compatible to the intended application, as well as the contingent size and shapes, can be any, depending on requirements.

Claims

1. A flexographic printing apparatus for application to offset printing units, characterized in that said apparatus comprises, at a printing plate bearing cylin-

der of an offset printing machine, a supporting unit for supporting a plurality of anilox cylinders, which can be caused to selectively contact said printing plate bearing cylinder.

2. A flexographic printing apparatus, according to the preceding claims, characterized in that said supporting unit comprises two heads which are provided, on the periphery thereof, with recesses for housing therein the end portions of a plurality of anilox cylinders.
3. A flexographic printing apparatus, according to the preceding claims, characterized in that said anilox cylinders are provided in a number of four and that said supporting unit is a rotary supporting unit.
4. A flexographic printing apparatus, according to one or more of the preceding claims, characterized in that said apparatus further comprises a driving slide for bringing an anilox cylinder from said supporting unit to contact said printing plate bearing cylinder.
5. A flexographic printing apparatus, according to one or more of the preceding claims, characterized in that said apparatus further comprises supporting assemblies for supporting said anilox cylinder in a contact relationship with said printing plate bearing cylinder, having a truncated cone configuration, for axially engaging and centering the anilox cylinder.
6. A flexographic printing apparatus, according to one or more of the preceding claims, characterized in that said apparatus further comprises a driving geared unit for turning said anilox cylinder for inking said printing plate.
7. A flexographic printing apparatus, according to one or more of the preceding claims, characterized in that said apparatus further comprises an ink application unit coupled to said anilox cylinder in turn coupled to said printing plate bearing cylinder, and comprising moreover a pair of doctor blades for delimiting an inking chamber and metering the ink.
8. A flexographic printing apparatus, specifically designed for application to offset printing units, according to one or more of the preceding claims, and substantially as broadly disclosed and illustrated and for the intended objects.

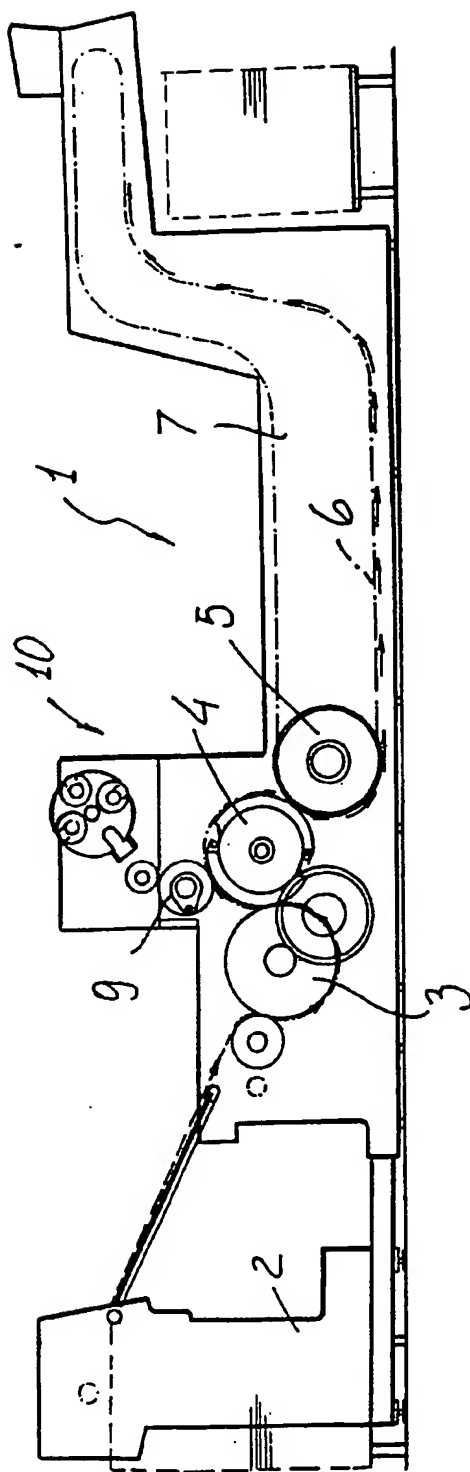


FIG. 1

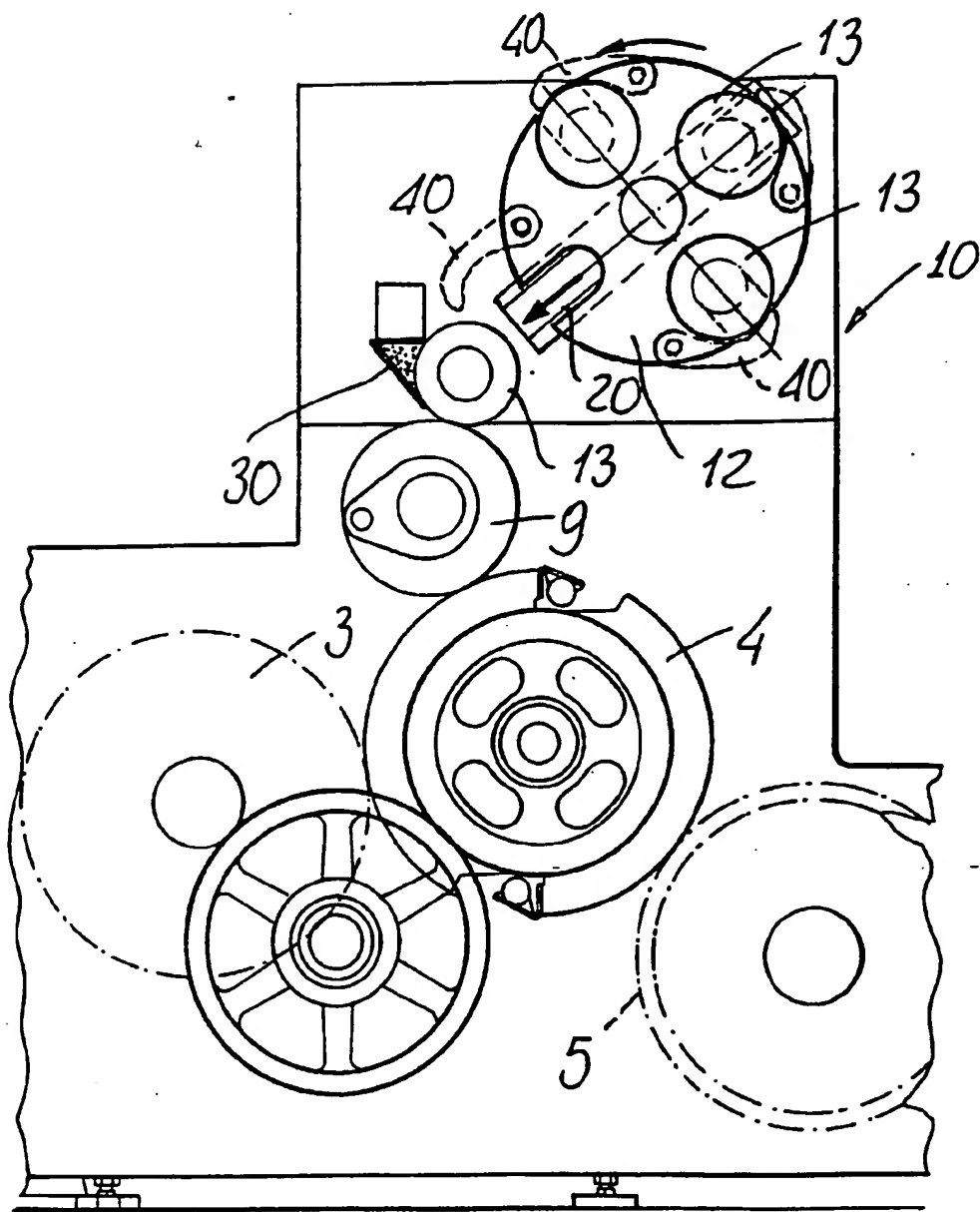
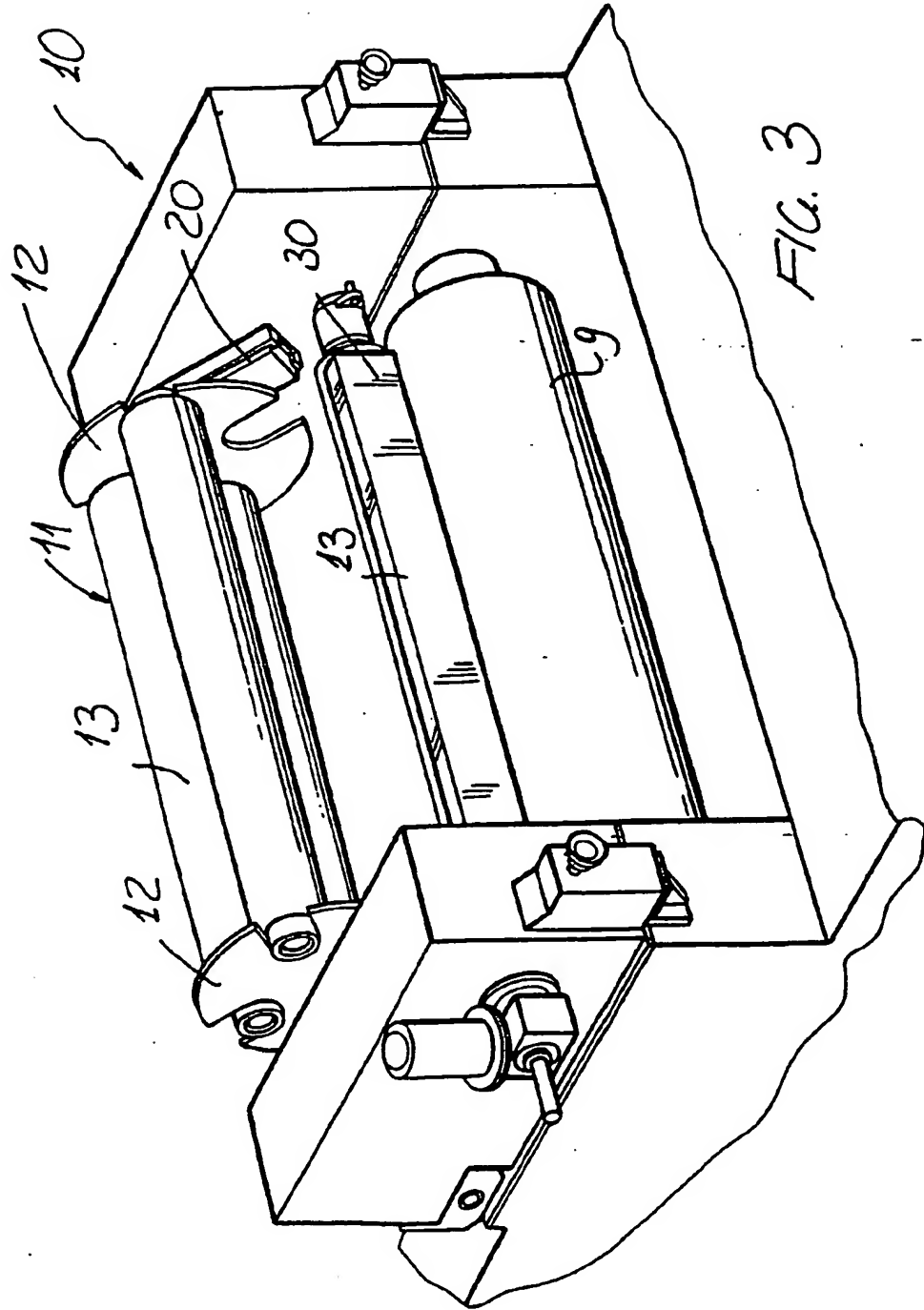


FIG. 2



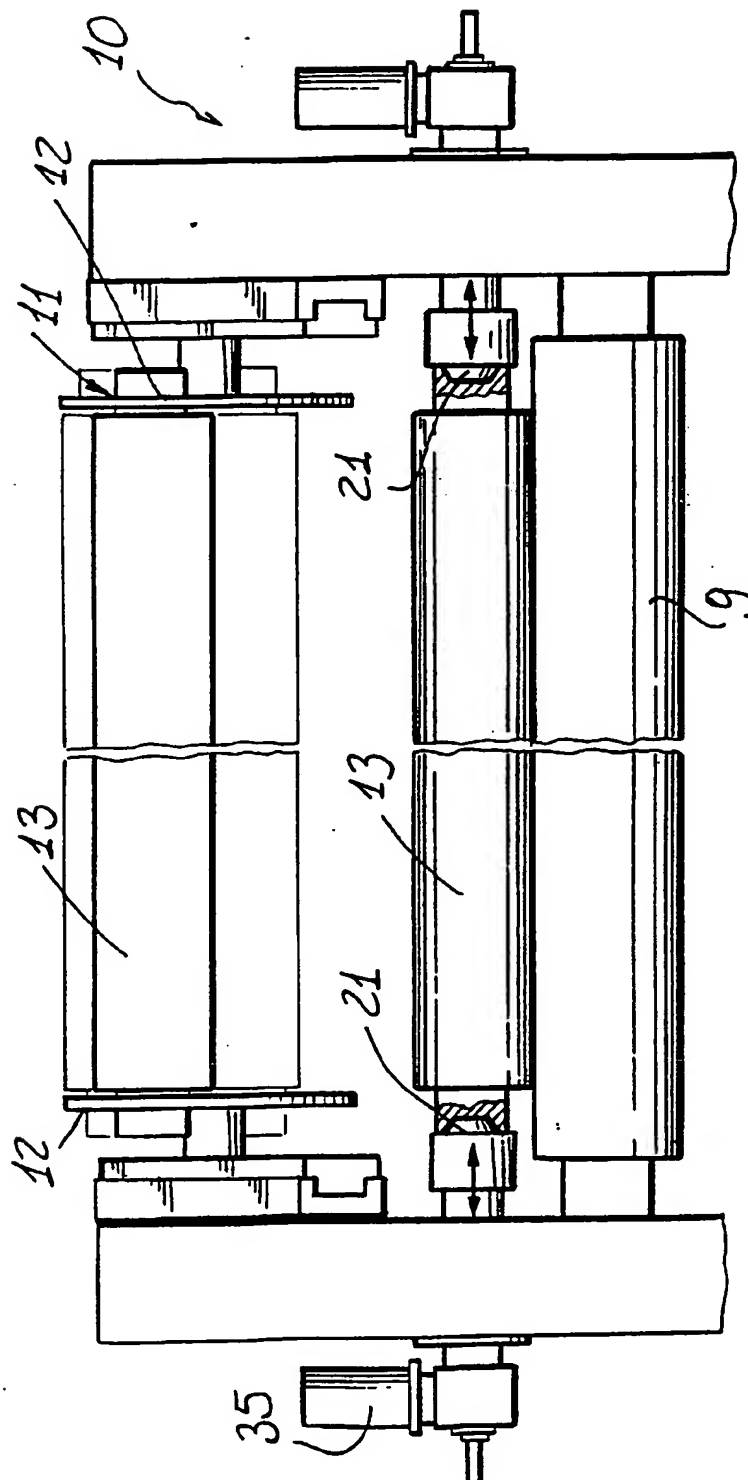


FIG. 4